

July 9, 2009

Chairman Julius Genachowski
Commissioner Michael J. Copps
Commissioner Robert M. McDowell
Federal Communications Commission
445 12th Street, SW
12th Street Lobby, TW-A325
Washington, D.C. 20554

Re: *Written Ex Parte Communication*, GN Docket No. 09-51, WT Docket Nos. 08-165, 09-66.

Dear Chairman Genachowski, and Commissioners Copps and McDowell:

Faced with the most daunting economic challenges in a generation, President Barack Obama has called on broadband to be a key driver in the revitalization of our short and long-term economic health. President Obama made clear that “now is the time to create jobs that remake America for the 21st century by rebuilding aging roads, bridges and levees; designing a smart electrical grid; and *connecting every corner of the country to the information superhighway.*”¹ In this *ex parte*, CTIA highlights the substantial contributions that the wireless industry is making to achieve President Obama’s economic and infrastructure goals. Indeed, as our nation struggles in a fiercely competitive global marketplace to revitalize once unchallenged industries, mobile broadband services bring opportunities for increased productivity and represent a beacon on the path toward renewed economic prosperity. Highlights of the wireless contributions include:

- Wireless carriers directly employ more than 268,000 people, a number that has grown more than 6% year-over-year for the last four years.
- Total wireless expenditures on structures and equipment from 1998-2007 totaled more than \$217 billion.
- Carriers responding to CTIA’s Semi-Annual Survey reported an average combined investment of more than \$22.8 billion per year to upgrade their networks from 2001 through 2008.
- Economic contributions of wireless services have grown significantly faster than the rest of the U.S. economy, averaging over 16% growth vs. less than 3% for the remainder of the economy.
- Wireless jobs command compensation that is more than 50% higher than the national average of other production workers.

¹ “The Action Americans Need,” Barack Obama, Washington Post (Feb. 5, 2009) (emphasis added).

- Beyond direct carrier employment, more than 2.4 million American jobs are either directly or indirectly dependent on the U.S. wireless industry.
- In 2007, U.S. wireless services delivered nearly \$100 billion in “value added” contributions to the U.S. Gross Domestic Product (“GDP”).
- As of December 2008, wireless carriers have deployed over 240 thousand cell sites across the country.
- Going forward, estimates place productivity gains from wireless broadband services at almost \$860 billion between 2005 and 2016.

The facts clearly demonstrate that wireless voice and broadband services are contributing mightily to the U.S. economy, through the massive capital investments of wireless providers, by creating high-paying, skilled jobs across the country, and with billions of dollars of direct and indirect benefits flowing from the innovative wireless services and applications consumers demand. The first section of this *ex parte* highlights the average yearly infusion of over \$22 billion in investment in the nationwide build-out of broadband networks that are empowering consumers with high-speed Internet access wherever they live, work or travel. The second section tracks the impact of wireless voice and broadband services on the economic health of our nation and the robust array of direct and indirect benefits that flow from wireless services. The third section details the role of the wireless industry in creating high-paying, skilled jobs across the country. Finally, CTIA submits the attached new economic analysis of the wireless industry’s contribution to the American economy, authored by Dr. Harold Furchtgott-Roth with a forward by Dr. Robert Atkinson. In this paper, Dr. Furchtgott-Roth details the wireless industry’s profound economic impact, while Dr. Atkinson aptly observes that “we have only begun to scratch the surface of the wireless revolution and its impact on economic growth, societal improvement and increased quality of life for individuals.”

As policymakers focus on developing a National Broadband Plan and leveraging our communications capabilities to revive our economy, it is important to remember the vital role that the wireless industry is playing in building that communications infrastructure, increasing productivity, and creating jobs. Today, virtually every business in the U.S. relies on networked communications services, and increasingly these businesses rely on mobile communications. The success of the mobile wireless industry – as a direct contributor to the U.S. economy and as an indirect input into businesses of all sizes – represents one of the crowning accomplishments of U.S. policy.

CTIA encourages the Commission to embrace the bedrock policy decisions, formulated in bipartisan fashion under the leadership of then-President Bill Clinton and Vice President Al Gore, which have made the mobile wireless environment the highly-innovative, rapidly-growing, and widely-accessible sector that it is today. As former Vice President Gore said at CTIA 2009 in Las Vegas, the United States has “the most competitive wireless industry of any nation in the world” which has resulted in “a continued pulse of investment to expand the capacity of broadband networks.” Given the federal assistance that has been required to stabilize other sectors such as the auto and financial industries, it is encouraging to see the robust performance of the wireless industry in the environment that Congress and the Commission have fostered for wireless services.

CTIA is greatly encouraged to see that President Obama himself has recognized the benefits wireless services, with his embrace of “Blackberry One” as a tool that will keep him as connected, if not more so, than “Air Force One.” We hope the information included in this filing reinforces the essential role that wireless services have to play in the revitalization of the U.S. economy. If you have any questions, please do not hesitate to contact me.

Sincerely,

/s/ Christopher Guttman-McCabe
Christopher Guttman-McCabe
Vice President, Regulatory Affairs
CTIA – The Wireless Association®

MOBILE IN AMERICA:

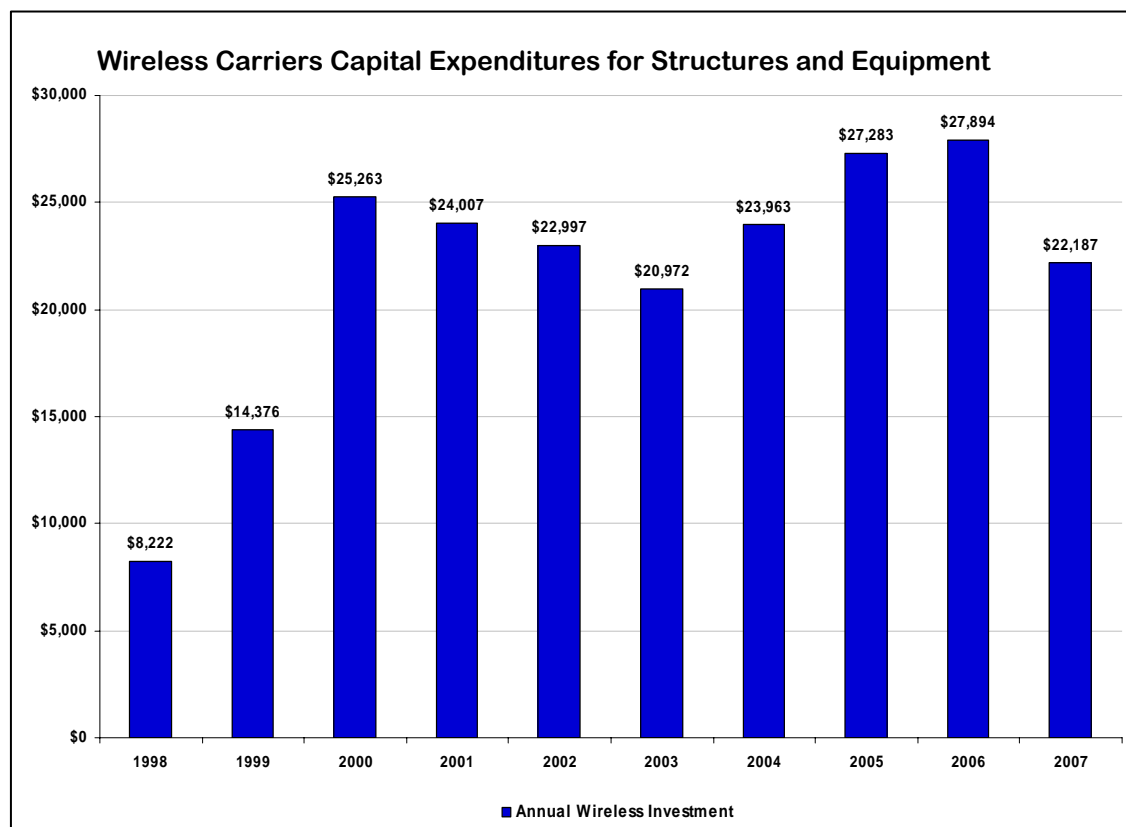
Driving the Economy and Delivering the Communications Infrastructure for the Information Age

July 2009

**Delivering a “Wherever,
Whenever” Communications
Infrastructure for the 21st
Century**

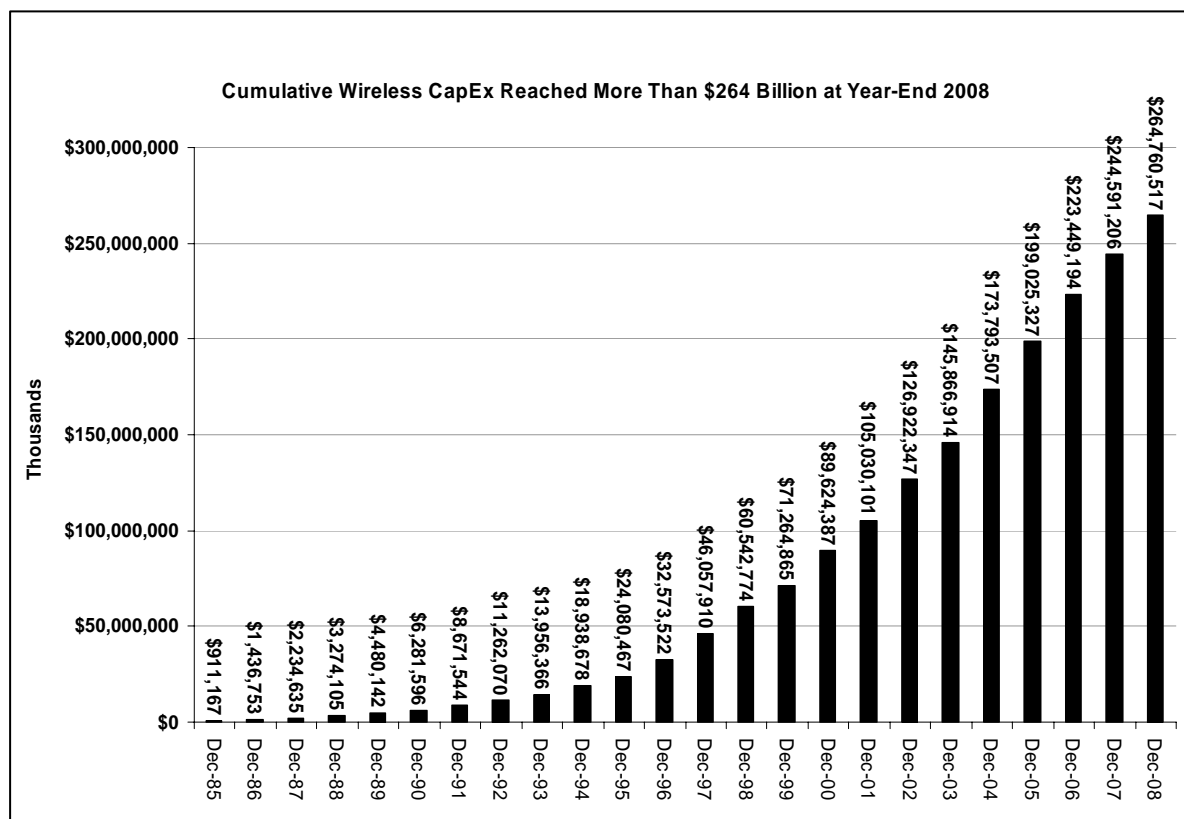
CTIA – The Wireless Association® (“CTIA”) is pleased to highlight for the Commission the massive contributions being made by the wireless sector to our nation’s communications infrastructure. For wireless carriers, the fact remains that network reliability and coverage are critical to carriers’ ability to compete. This competitive pressure drives carriers to invest billions of dollars each year to expand their service territories, improve the quality of their service and capacity of their networks, and bring innovative services to consumers across the country. Over the past twenty years, wireless carriers have made enormous investments in their networks, committing more than \$264 billion in cumulative capital expenditures. Even now, despite the most difficult economic times in recent memory, the wireless industry continues to commit substantial resources to meet evolving consumer demands, with total reported wireless carrier investment of more than \$20 billion for 2008.

- **According to the U.S. Census, total wireless expenditures on structures and equipment from 1998-2007 totaled more than \$217 billion.**
- **Carriers responding to CTIA’s Semi-Annual Survey reported an average combined investment of more than \$22.8 billion per year to upgrade their commercially-operational networks from 2001 through 2008.**
- **Neither of these figures includes the approximately \$33 billion paid by wireless carriers to the U.S. Treasury to acquire spectrum at auction in the last two FCC auctions.**
- **Neither of these figures include the massive investments that have gone into both handset and application development in the United States.**



Source: U.S. Census “Annual Census of Expenditures”

The wireless industry's astounding growth and improved quality of service would not be possible without such sizable commitments to innovative technology and infrastructure. The following chart shows the cumulative capital expenditures of wireless carriers over the past twenty-four years, illustrating the substantial financial commitment made to our nation's mobile infrastructure.



Source: CTIA Semi-Annual Survey

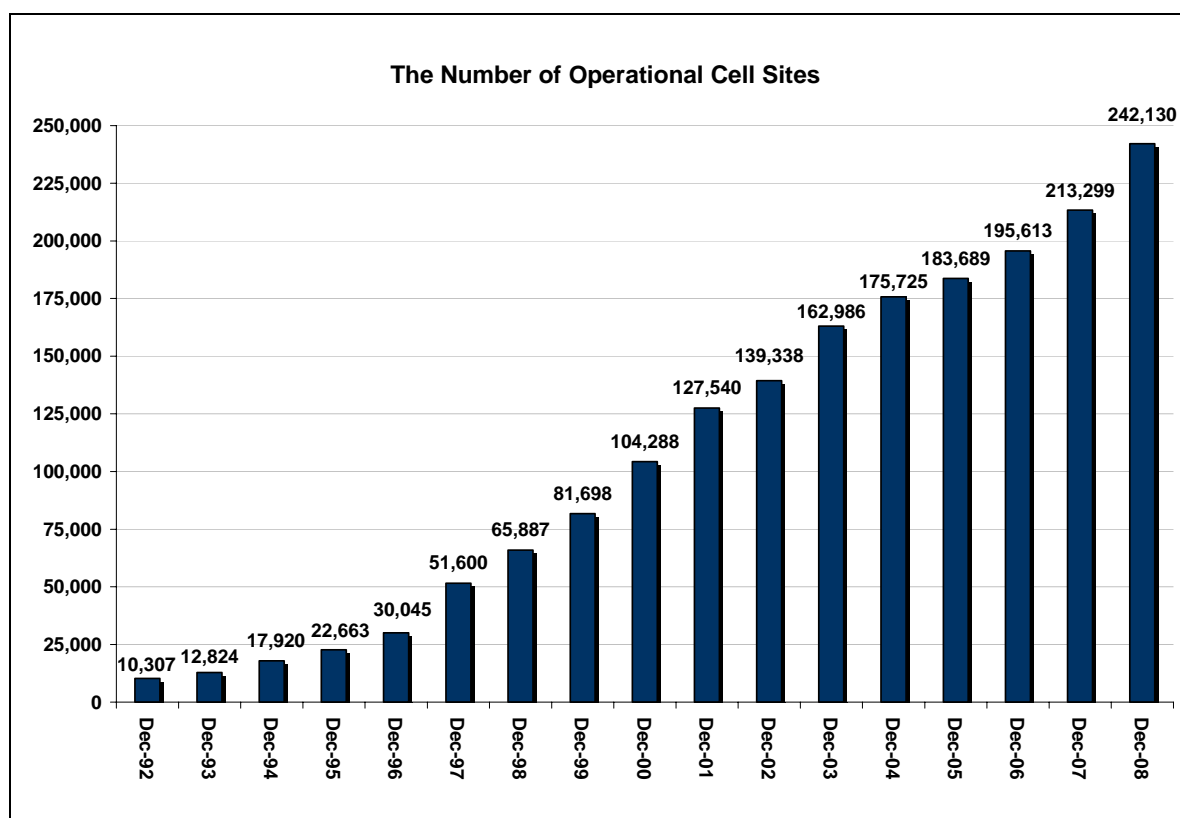
As a result of these investments, consumers across the country are able to access mobile wireless services, including mobile broadband. In its recent *Thirteenth CMRS Competition Report*, the Commission analyzed third-party data on wireless availability by the granular metric of census blocks. Through that analysis, the Commission found that “[a]pproximately 99.6 percent of the total U.S. population have one or more different operators (cellular, PCS, and/or SMR) offering mobile telephone service in the census blocks in which they live,” and “[m]ore than 95 percent of the U.S. population lives in census blocks with at least three mobile telephone operators competing to offer service.”² Notably, this rapid and expansive build-out of the mobile communications infrastructure occurred largely without the same access to universal service funds enjoyed by legacy wireline providers.

² Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Radio Services, WT Docket No. 08-27, Thirteenth Report, DA 09-54 at 5 (rel. Jan. 16, 2009) (“Thirteenth CMRS Competition Report”).

Wireless carriers across the country, including those in rural markets, are continually deploying mobile data and broadband technologies to bring new services at faster speeds to consumers. According to FCC estimates, approximately 92 percent of the U.S. population lives in census blocks with at least one mobile broadband provider.³

To reach these consumers, wireless carriers have deployed hundreds of thousands of cell sites across the country. In the next chart, CTIA highlights the increasing number of cell sites deployed across the country.

- **As of December 2008, wireless carriers have deployed over 240 thousand cell sites across the country.**
- **The number of new cell sites added over the last five years has increased significantly from year-to-year, both in terms of raw numbers and as a percentage of the total number of cell sites.**
- **The number of cell sites is likely to increase substantially as carriers deploy networks in the AWS and 700 MHz spectrum as well as upgrade their networks to 4th generation (4G) technologies.**



Source: CTIA Semi-Annual Survey

³ *Thirteenth CMRS Competition Report* at 9.

Despite this considerable success, there remain areas in the United States where ubiquitous wireless and mobile broadband networks remain an unfulfilled goal. To estimate the challenge ahead, CTIA commissioned a detailed analysis of the scope of these unserved areas and the projected cost to complete the initial build-out of a Third Generation (3G) broadband-capable wireless network.⁴

- **Based on commercially-available data, the CostQuest study determined that about 23.2 million U.S. residents live in areas where 3G wireless broadband service has not yet been deployed and that approximately 43% of roads lack such coverage.**
- **The study estimates that the initial effort to construct a dual-mode broadband-capable network to reach these remaining U.S. residents and roads will require an additional investment of approximately \$22 billion.**

Delivering on this promise of mobile broadband will require new cell sites (including towers) to be constructed and existing sites to be augmented with 3G technologies. Specifically, CostQuest estimates that:

- **To achieve full 3G mobile broadband coverage, approximately 16,000 new sites will need to be constructed and 55,000 existing sites will need to be upgraded.**

The table on the following page includes state-by-state and total estimates for the numbers of new cell sites and augmentations of existing sites required to deliver full 3G mobile broadband coverage throughout the nation, as well as total investment that will be required for these deployments.

⁴ “U.S. Ubiquitous Mobility Study,” CostQuest Associates, filed at Attachment to CTIA Comments in WC Docket No. 05-337 (Apr. 17, 2008) (“*CostQuest Mobility Study*”).

Estimates for New and Augmented Cell Sites and Investment Required for Full 3G Deployment

State	Est. Count of New Sites	Est. Count of Augmentation of Existing Sites	Est. Investment
Alabama	130	2,068	\$ 351,445,500
Alaska	1,678	440	\$ 1,602,373,500
Arizona	913	640	\$ 919,842,000
Arkansas	176	1,151	\$ 291,201,750
California	769	2,182	\$ 975,969,750
Colorado	815	620	\$ 821,598,750
Connecticut	4	201	\$ 25,793,250
Delaware	3	110	\$ 14,852,250
District of Columbia	-	-	\$ -
Florida	151	2,010	\$ 361,100,250
Georgia	135	2,467	\$ 396,448,500
Hawaii	51	135	\$ 63,388,500
Idaho	726	473	\$ 720,189,750
Illinois	87	1,565	\$ 260,442,000
Indiana	52	1,477	\$ 211,664,250
Iowa	103	1,282	\$ 263,282,250
Kansas	327	1,355	\$ 457,558,500
Kentucky	117	791	\$ 209,013,000
Louisiana	94	1,543	\$ 267,671,250
Maine	151	542	\$ 216,305,250
Maryland	18	411	\$ 62,921,250
Massachusetts	19	282	\$ 48,683,250
Michigan	187	1,762	\$ 377,711,250
Minnesota	341	1,211	\$ 473,550,000
Mississippi	125	1,348	\$ 276,512,250
Missouri	147	1,484	\$ 324,350,250
Montana	1,252	691	\$ 1,245,147,750
Nebraska	344	1,113	\$ 457,742,250
Nevada	1,012	463	\$ 986,658,750
New Hampshire	31	264	\$ 58,605,750
New Jersey	10	265	\$ 38,298,750
New Mexico	890	824	\$ 934,048,500
New York	205	1,555	\$ 363,090,000
North Carolina	107	2,007	\$ 321,226,500
North Dakota	509	498	\$ 528,207,750
Ohio	50	1,557	\$ 220,095,750
Oklahoma	121	1,260	\$ 290,865,750
Oregon	373	1,159	\$ 522,501,000
Pennsylvania	148	1,427	\$ 295,695,750
Rhode Island	1	7	\$ 1,680,000
South Carolina	26	1,801	\$ 222,174,750
South Dakota	553	541	\$ 575,851,500
Tennessee	94	1,374	\$ 244,823,250
Texas	930	5,719	\$ 1,567,933,500
Utah	626	476	\$ 639,103,500
Vermont	66	85	\$ 69,987,750
Virginia	105	1,609	\$ 274,018,500
Washington	387	937	\$ 468,825,000
West Virginia	142	387	\$ 180,180,000
Wisconsin	171	1,314	\$ 317,651,250
Wyoming	929	309	\$ 882,703,500
Total	16,413	55,275	\$ 21,721,680,750

Source: *CostQuest Mobility Study*

Of course, continued mobile broadband growth depends on the availability of sites for the construction and placement of towers and transmitters. Before a site can be utilized as a wireless tower location, zoning approval is generally required at the state or local level – a process that can be extremely time-consuming. CTIA and numerous others have documented the widespread zoning delays across the country. These delays threaten the Act’s goal of “... deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans” and are a substantial impediment to the American Recovery and Reinvestment Act’s goals of speeding broadband deployment and creating new jobs.

Fortunately, the Commission has ample authority under the Communications Act to address these impediments. By granting CTIA’s pending Petition for Declaratory Ruling, the Commission can clarify the process for state and local review of wireless facility siting applications.⁵ This simple step would not only help wireless providers deliver on the Congressional goal of bringing broadband to all Americans but would also free them to invest in the construction of these additional cell sites and the new equipment required for augmentation of existing sites. From a broader perspective, action on this petition would help achieve President Obama’s objectives by providing both short-term jobs and long-term economic benefit.

⁵ See, e.g., CTIA Petition for Declaratory Ruling to Clarify Provisions of Section 332(c)(7)(B) to Ensure Timely Siting Review and to Preempt Under Section 253 State and Local Ordinances that Classify All Wireless Siting Proposals as Requiring a Variance, WT Docket No. 08-165 (filed July 11, 2008) (“*CTIA Petition for Declaratory Ruling*”).

Driving an Increasingly Mobile Economy

This section describes the large and growing role of wireless services in the U.S. economy by highlighting contribution to Gross Domestic Product (“GDP”), growth rates, and indirect benefits associated with wireless services, including mobile broadband. Indeed, whether measured or characterized in terms of value-added, consumer welfare gains, cost savings or productivity enhancements, the U.S. wireless industry has been and remains a powerful force for good in the American economy – a role that it promises to maintain in the current economic recovery.

As a result of the wireless industry’s investment and consumers’ rapid adoption of innovative wireless services, the wireless sector has become a major (and growing) component of the American economy. Investment in mobile broadband infrastructure results in increased jobs and income through direct investment in building and augmenting wireless sites but also indirectly by providing (and improving) wireless services to more U.S. consumers and businesses. As Dr. Alan Pearce and Dr. Michael Pagano concluded in a recent study of the wireless industry,

[I]mproved wireless broadband access can create new businesses based on the availability of faster Internet connections, existing organizations can reap gains in efficiency and will identify new sources of revenue, health and public safety services can be enhanced and made available to a wider audience, and consumers can search online more effectively for goods, services, jobs, and educational opportunities.⁶

Wireless Contributions to U.S. Gross Domestic Product are Substantial and Growing

It is clear that the wireless services industry provides substantial value added to the U.S. economy. In the attached paper, Dr. Furchtgott-Roth analyzed the “value added” contribution of the wireless industry to determine the industry’s impact on U.S. GDP.⁷ Measurements of value added – the “most consistent measure of an industry’s economic contribution” – reflect an industry’s returns on capital and labor.⁸

- **As shown in the chart below, the U.S. wireless industry contributed nearly \$100 billion in value added to the American economy in 2007.**⁹

Economic Contribution of Wireless Networked Communications Services in 2007		
	Value Added (in billions of dollars)	Percentage Share of American economy
Wireless services	99.7	0.73

Source: *Furchtgott-Roth Wireless Services Sector Report*

⁶ “Accelerated Wireless Broadband Infrastructure Deployment: Impact on GDP & Employment 2009-2010,” Alan Pearce and Michael Pagano, at 3 (Dec. 2008) (“*Pearce-Pagano Wireless Deployment*”).

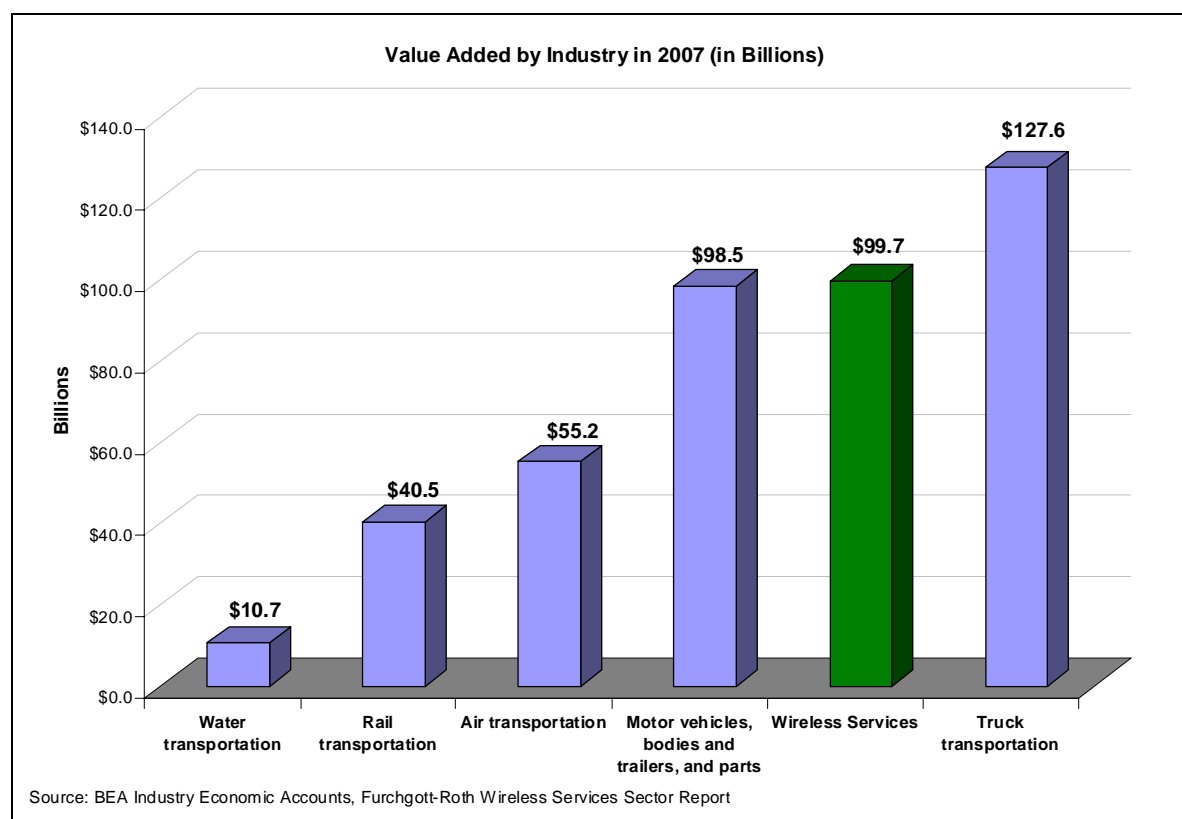
⁷ “The Wireless Services Sector: A Key to Economic Growth in America,” Harold Furchtgott-Roth, at 4-5 (Jan. 2009) (“*Furchtgott-Roth Wireless Services Sector Report*”).

⁸ *Id.* at 5.

⁹ *Id.* at 4, Table 10.

The magnitude of this economic contribution is particularly striking when compared to other leading industry segments. The contribution from wireless services are, by themselves, greater than those of the motor vehicle manufacturing sector, motion pictures, and many large sectors of manufacturing.¹⁰ Indeed, the wireless sector alone is comparable to the entire economic contribution from the agricultural sector in the U.S.¹¹

As Chairman Julius Genachowski has aptly observed, “[broadband] “matters for the same reason that previous generations built systems of canals, and railroads, and interstate highways, and a telephone network that stretched to every corner of America . . . [I]nfrastructure matters. It is the way jobs and commerce, innovation and progress of all kinds – in education and health care and energy – are spread across the country.”¹² So, it is worth noting, as the following chart shows, that the economic contributions of the wireless industry already exceed the contributions of rail and air transportation combined.



Given the enormous federal assistance that has been required to stabilize industries such as the auto industry, it is encouraging to see the robust performance of the wireless industry in the environment that Congress and the Commission have fostered for wireless services.

¹⁰ *Id.* at 5.

¹¹ *Id.*

¹² Statement of Chairman Julius Genachowski, Federal Communications Commission, Seneca High School, Erie, Pennsylvania (July 1, 2009).

Economic Growth in Wireless Services is Leading the Way

Not only is the U.S. wireless industry a sizable contributor to the U.S. economy but the economic contribution of wireless services have also grown significantly faster than the rest of the U.S. economy.

- **Growth in economic contributions from wireless services has averaged over 16% per year during the fifteen years between 1992 and 2007.**¹³
- **This staggering growth rate compares to average growth of less than 3% for the remainder of the economy during this time.**¹⁴

It is clear that even within the larger networked communications sector – which accounts for nearly a trillion dollars in economic activity – wireless services are leading the way. Over both the short- and long-term, the wireless industry has grown faster than other related communications industries. As shown in the chart below, the economic growth rates for wireless services are significantly higher than those for the other networked communications industries, particularly over the past five years. Even taking into account the wireless industry’s more modest growth rate of 12% during this time, “no other major sector of the economy has grown more rapidly.”¹⁵

As the table on the following page illustrates, the growth of the wireless industry is particularly striking in comparison to the remainder of the economy.

¹³ *Id.* at 7, Table 11.

¹⁴ *Id.* at 1.

¹⁵ *Id.* at 8.

Historical Value Added and Contribution of Industries Related to Networked Communications Services -- Average Annual Growth Rate			
	1992-1997	1997-2002	2002-2007
Wireless services	20.1%	19.1%	11.2%
Other networked communications services (incl. wireline, cable, broadcast, and satellite)	2.5%	2.0%	-1.1%
Upstream industries (incl. equipment, software, and services)	10.3%	-7.5%	-0.1%
Downstream industries (incl. wholesale and retail distribution channels)	7.1%	-0.6%	1.8%
Related computer industries	12.31%	1.73%	2.88%
Total sector related to networked communications services	8.41%	1.69%	2.19%
Remainder of economy	3.14%	3.01%	2.90%

Source: *Furchtgott-Roth Wireless Services Sector Report*

Wireless Services Contribute Billions of Dollars of Indirect Benefits

A number of earlier studies have considered the broader benefits of broadband adoption, finding that increases can lead to meaningful positive effects on economic activity.¹⁶ These studies have found that increases in broadband penetration can yield increases in both employment and GDP. While these prior studies did not focus exclusively on wireless broadband, more recent analysis by economists Alan Pearce and Michael Pagano has identified several areas of positive externalities stemming from increased wireless broadband access. According to Pearce and Pagano, positive externalities from wireless broadband include:

- **Increased opportunities for retailing and delivery due to online shopping;**
- **Greater telecommuting, alleviating traffic congestion, reducing pollution, and reducing gasoline consumption;**
- **Greater educational opportunities;**
- **Better matching of employee skills with employer needs;**
- **Improved public safety communications;**
- **New telemetry-based applications solutions such as point-of-sale applications;**
- **More effective financial management due to electronic banking and online searches for more favorable financial terms;**
- **Improved agricultural production due to weather monitoring and enhanced farming information.**¹⁷

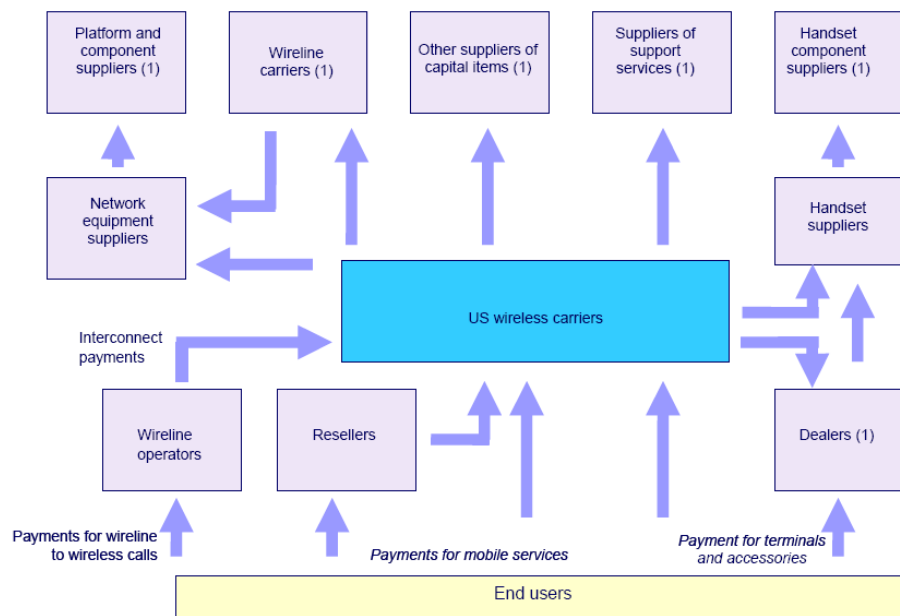
Based on an analysis of these positive externalities, Pearce and Pagano estimated that increased wireless investment could lead to increased GDP of between \$126-184 billion over the next two years.¹⁸

¹⁶ *Pearce-Pagano Wireless Deployment* at 8-9 (citing studies by Crandall, Lehr, and Litan; Sacramento Regional Research Institute (SRRI); and the Department of Commerce).

¹⁷ *Id.* at 7.

¹⁸ *Id.* at 22, Table 3.

Indeed, the benefits of increased investment in mobile broadband are felt not only by consumers, but also up and down the wireless industry value chain. The following chart illustrates the flow of revenues upstream and downstream along the wireless value chain:¹⁹



Source: 2005 Ovum Wireless Report

Wireless Services are Driving Productivity Gains Across the Economy

A growing body of literature demonstrates that the wireless industry is having a massive impact on productivity across the U.S. economy.²⁰ In a 2008 report, economic analyst firm Ovum estimated that wireless voice services played a central role in improving U.S. productivity.²¹ Among the many areas experiencing productivity gains, Ovum identified four major examples: 1) faster and more efficient decision-making; 2) reduction of unproductive travel time; 3) significant improvements in logistics; and 4) empowering small business.

- **Wireless Voice: Consumers enjoyed welfare gains of approximately \$157 billion in 2004 as a result of improved efficiencies associated with wireless voice services, alone.**²²

Extending this analysis beyond wireless voice services, Ovum finds even greater gains in productivity in the adoption of mobile broadband services. The 2008 Ovum study identified 360

¹⁹ “The Impact of the US Wireless Telecom Industry on the US Economy,” Roger Entner & David Lewin, Ovum, at 9 (Sept. 2005) (“2005 Ovum Wireless Report”).

²⁰ See 2005 Ovum Wireless Report; “The Increasingly Important Impact of Wireless Broadband Technology and Services on the U.S. Economy,” Roger Entner, Ovum, at 6 (2008) (“2008 Ovum Wireless Report”); “Mobile Broadband For the Masses,” Soren Buttekereit, Luis Enriquez, Ferry Griijpink, Suraj Maraje, Wim Torfs, Tanja Vaheri-Delmulle, McKinsey & Company (Feb. 2009).

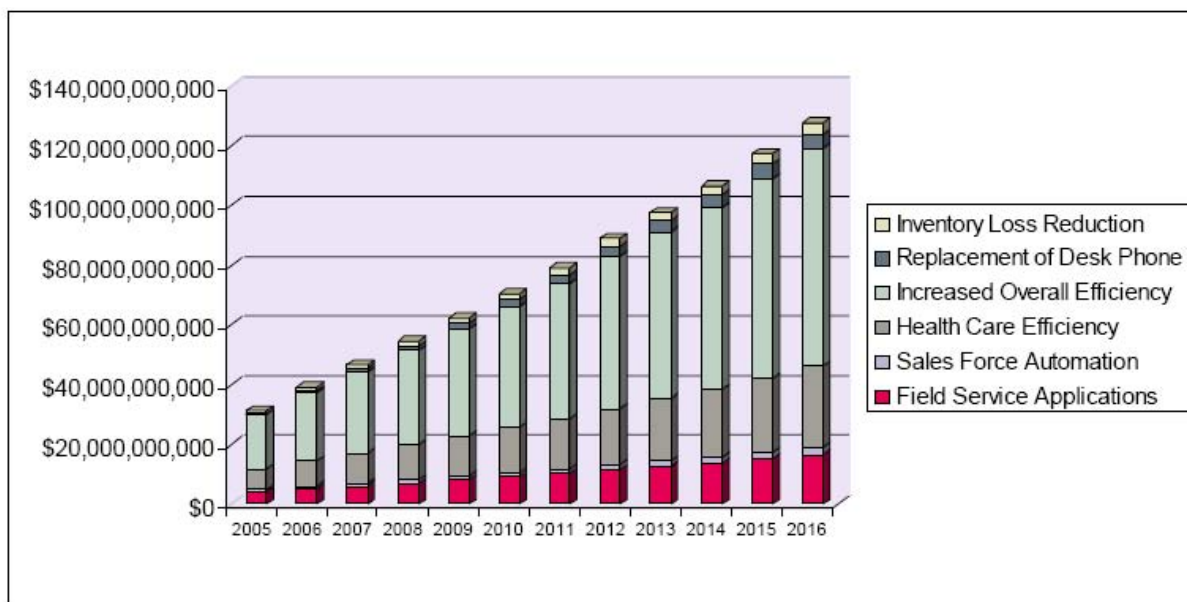
²¹ 2008 Ovum Wireless Report at 6.

²² *Id.* at 6.

job types – translating into over 81 million employees – which could benefit from using mobile broadband services.²³ Ovum also identifies at least six major areas where mobile broadband deployment are resulting in economic efficiencies, including 1) more efficient management of inventory and other business resources; 2) health care efficiency gains; 3) automating field service and fleet management; 4) reduced inventory losses due to more timely and accurate information; 5) sales force automation; and 6) cost savings from replacement of landline desk phones with mobile wireless devices.

- **Wireless Broadband: Looking at these six major areas of efficiency gains, Ovum estimates that the U.S. economy will experience productivity gains from mobile broadband services of almost \$860 billion in the decade between 2005-2016.²⁴**

The following chart illustrates the estimated annual economic benefits from these six major areas of productivity gain:



Source: 2008 Ovum Wireless Report

Together, these statistics illustrate the substantial positive impact that wireless services are having – and should continue to have – on the U.S. economy.

²³ *Id.* at 6.

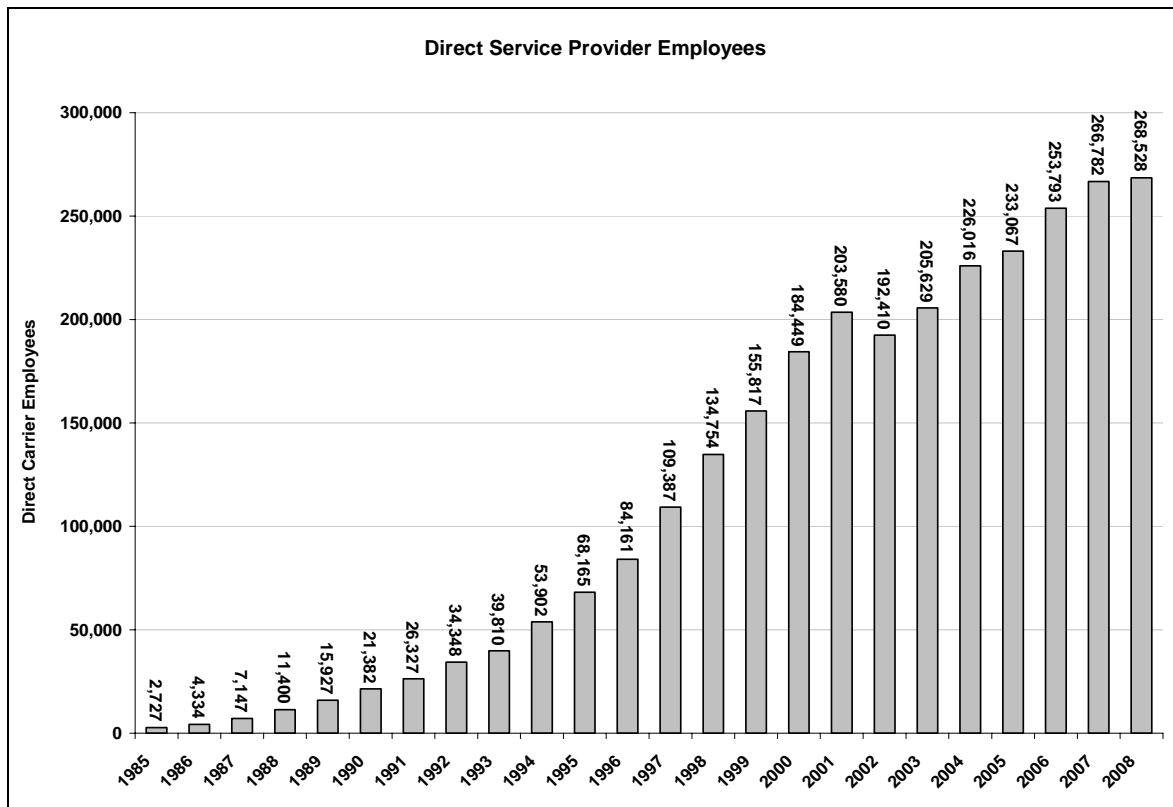
²⁴ *Id.* at 4.

Creating Jobs

Among the many benefits of the explosion of wireless innovation and consumer adoption is an ever-increasing array of high-paying, skilled jobs. The wireless industry has become a powerful and consistent creator of desirable jobs. As Dr. Furchtgott-Roth explains, “[e]mployment and employment compensation are two of the primary measures of economic activity in an industry.”²⁵ By both measures, the wireless industry is continuing to grow and bring economic benefits to U.S. workers. A quick snapshot of the job creation occurring in the wireless industry demonstrates:

- **Wireless carriers directly employ more than 268 thousand people.**²⁶
- **The number of jobs with wireless carriers has grown more than 6% year-over-year for the last four years.**
- **Looking beyond direct carrier employment, we find that an enormous number of American jobs – more than 2.4 million – are either directly or indirectly dependent on the U.S. wireless industry.**

The following chart details the number of workers directly employed by wireless carriers from 1985 to 2008:



Source: CTIA Semi-Annual Survey

²⁵ Furchtgott-Roth *Wireless Services Sector Report* at 4.

²⁶ CTIA Semi-Annual Survey.

Not only is the wireless industry rapidly creating jobs, but it is creating highly-paid, desirable opportunities.

- **Jobs with wireless carriers command compensation that is more than 50% higher than the national average of other production workers.**²⁷

The wireless industry's sterling record of job creation is particularly important to keep in mind given that President Obama has made it clear that improving employment levels is among his highest priorities for restoring our economic health. The Administration has made clear:

President Obama's first priority in confronting the economic crisis is to put Americans back to work. The American Recovery and Reinvestment Plan signed by the President will spur job creation while making long-term investments in health care, education, energy, and infrastructure.²⁸

Given the wireless industry's high level of job creation, it is clear that the wireless industry is well-situated to be a leading player in the effort to meet President Obama's economic and infrastructure goals.

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²⁷ Furchtgott-Roth *Wireless Services Sector Report* at 8, Tbl. 13.

²⁸ Obama Administration Technology Policy, viewed at www.whitehouse.gov/issues/economy. See also "White House unveils plan for more jobs," Robert Schroeder, *Seattle Times* (June 9, 2009) ("The pressure on the White House to help create jobs is intense. Last week, the Labor Department reported that the U.S. unemployment rate rose to a 26-year high of 9.4 percent in May, even as the pace of job losses moderated that month.").

CONCLUSION

As described above, wireless services, and mobile broadband in particular, are playing an increasingly central role in a larger set of industries. Dr. Atkinson, observing this phenomenon, explains that:

[W]ireless applications beyond the cell phone are growing dramatically, from wireless sensor networks in neighborhoods to measure air quality and pollution, to wireless data readers that let medical devices transmit data from patients to their doctors automatically, to wireless enabled smart parking spaces to let drivers know where empty spaces are.²⁹

Considering these trends, and the economic data presented above, the inescapable conclusion is that the wireless industry – with its massive capital investments, innovative services, and significant job creation – is key to restarting our economic engines. CTIA looks forward to working with the Commission toward these ends.

Pursuant to Section 1.1206 of the Commission's rules, a copy of this letter is being filed via ECFS with your office. Should you have any questions, please do not hesitate to contact the undersigned.

Sincerely,

/s/ Christopher Guttman-McCabe
Christopher Guttman-McCabe
Vice President, Regulatory Affairs
CTIA – THE WIRELESS ASSOCIATION®
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²⁹ Robert Atkinson, Forward to *Furchtgott-Roth Wireless Services Sector Report* at i (Jan. 2009).

ATTACHMENT

The Wireless Services Sector: A Key to Economic Growth in America
2008 Report

Harold Furchtgott-Roth¹

January 2009

Forward

The digital information and communications technology revolution is transforming our economy and society, leading to significantly higher rates of productivity and growth and to a host of improvements to our daily lives. As former FCC Commissioner Harold Furchtgott-Roth documents, wireless telecommunications has played a key role in that process. Perhaps the most striking finding from his analysis is the speed at which the wireless industry has grown, more than 20 percent per year between 1992 and 2002, and 12 percent per year since then. As wireless services - first a "cell phone," but now increasingly a multi-function device incorporating email, a camera, GPS functionality, - have grown, the economic impact of the industry has as well, to the point now where it contributes nearly \$100 billion in economic activity to the U.S. economy. But as the report shows, this growth has come because of increased demand by consumers, and not increased prices by the industry. Indeed, wireless voice prices have consistently fallen over time. The industry also provides economic opportunity for more than a quarter million workers - located in every state - that are paid on average 50 percent more than the hourly wages of all production workers.

While the report is a look at the past and present of the industry, perhaps what is most exciting is the future. For while a large share of Americans now have cell phones, the industry itself appears to be still growing impressively. Wireless data applications (e.g., email, Internet) are the fastest growing segment of the industry now. But as ITIF documented in a recent report *Digital Quality of Life: Understanding the Personal and Social Benefits of the Information Technology Revolution* a whole array of important applications are emerging. Wireless GPS-enabled devices now can let people with visual disabilities better navigate on their own through a voice activated, voice prompt cellular device. All of us might soon be able to conduct a host of transactions with our cell phone - from paying a fee at a parking garage or parking meter, to showing your electronic boarding pass to get on a plane, to getting on a bus and train. And of course, wireless applications beyond the cell phone are growing dramatically, from wireless sensor networks in neighborhoods to measure air quality and pollution, to wireless data readers that let medical devices transmit data from patients to their doctors automatically, to wireless enabled smart parking spaces to let drivers know where empty spaces are. In fact, we have only begun to scratch the surface of the wireless revolution and its impact on economic growth, societal improvement and increased quality of life for individuals. As such if Mr. Furchtgott-Roth were to again look at the economic impact of the wireless industry in 2018, he will likely find that it has continued its robust growth rates and in so doing was providing even more economic opportunity.

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Executive Summary

The wireless services industry is one of the fastest growing industries in America. For the past 15 years, it has grown at well over 16 percent per year, while the remainder of the economy has barely grown at 3 percent. It employs more than 250 thousand workers and is an integral part of the economy of every state.

In 2007, U.S. businesses and consumers spent more than \$180 billion on wireless services and equipment. The labor and capital contributions of the industry added more than \$100 billion to the American economy. There are more than 266 million active wireless subscriptions in the U.S. – equal to 86% of Americans, including millions of teenagers and seniors.

Wireless services are part of a broader set of networked communications industries that have reshaped the American economy. Tens of thousands of American businesses supply networked communications services, and tens of thousands more distribute these services to the American consumer. The broader communications sector, together with the related computer sector, has at a minimum nearly \$1 trillion of annual economic activity, or 6.7% of the national economy. Although this broader sector is not exclusively wireless, the current engine of growth across both sectors is clearly wireless.

Exactly what comprises the wireless services industry, and how large is its contribution to the American economy? This paper answers those questions; however, I caution readers not to view the wireless industry merely as a quantum of numbers. To do so means the reader will fail to understand how wireless services have fundamentally altered the fabric of American culture and society. This paper reaches five conclusions:

- Wireless services have changed our society;
- Demand for wireless services is robust and growing;
- Employment and employment compensation in the wireless industry are large and growing;
- The wireless services industry is a large and growing segment of the American economy; and
- Wireless services are the hub of the wheel of a much larger set of industries that contribute to American economic growth.

A. Wireless services have changed our society

We do not live in isolation, and part of the core of humanity is to communicate with one another. In fact, the advance of civilization can be in large part measured by the advance of human communications. For most of human history our ability to communicate with one another has been limited to the sense of touch, to speech within earshot, and to gestures within eyesight. In the past three millennia, written words and drawn images provided a form of one-way communications. People in one location could send letters and messages to people in another location, or leave messages for a later time. But two-way conversations remained constrained by distance and time.

Over the past one and one-half centuries new technologies have enabled new and different kinds of communications among people scattered over both short and long distances. These communications services are widely known as *networked communications services*.

Beginning in the 19th century, the telegraph and the telephone made unwritten communications possible over long distances, not merely within earshot but along networks of copper wire linked with special equipment. The wired telephone network became the standard for instantaneous, two-way communications. Its limitations were primarily that users were tied to a wire with limited capabilities. This meant that consumers could not move and communicate at the same time, and were limited to just one kind of two-way communication, voice, via their telephone.

In the 20th century, further technological advances expanded both the types and capabilities of human interaction. One-way communications with radio enabled mobility, television enabled video services, satellite services conquered the challenges of enormous geographic distances, cable services introduced Americans to the convenience of substantial quantities of video services. These and other networked communications services profoundly altered and enriched the ways Americans communicated through the end of the 20th century. Not surprisingly, provision and use of these services generated substantial contributions to the American economy and to other economies around the world.

For all of the merits and consumer conveniences these older and more mature networked communications services provided, none has so rapidly attracted the imagination of much of humanity as wireless communications services. In merely half a generation, 3.3 billion people, or roughly half of the world's population, now subscribes to mobile services.² In much of North America, Europe, and parts of Asia, wireless penetration rates approach or exceed 100 percent of the population. More than 266 million Americans subscribe to these services, and in many instances they are replacing wireline connections.³ Americans use wireless services at home, at work, and at school.

Wireless services are not only ubiquitous, but they have profoundly altered manners of speech and communications. New words, new idioms, new forms of etiquette

for speech in private and in public have emerged with the proliferation of wireless services. Concepts of personal and public safety have evolved, as have the ways in which we can access knowledge and use it and how we entertain ourselves.

Americans under the age of 30 have grown up with wireless devices. They can not fathom an America without mobile wireless services, which was viewed as the height of luxury a mere generation ago. They cannot imagine an America without the convenience and security of mobile wireless services that allow them to stay in touch, any time, any place, and during any mode of travel. Fashion and artistic expression may change and evolve in unpredictable paths, but it is unimaginable that American society and civilization will ever abandon wireless services. They define who we are today and will continue to do so tomorrow.

B. Demand for wireless services is robust and growing

We Americans have an unquenchable thirst for all things mobile wireless, and we are willing to pay for it. As shown in Table 1, revenues for the commercial wireless services industry have grown from \$129 billion in 2004 to \$182 billion in 2007. This revenue has been earned providing mobile voice service, wireless broadband services, software, ring tones, handsets, and more.

Table 2 presents for 2005 by state actual wireless customer service expenditures as well as an estimate of total industry revenue.⁴ The state with the largest consumer and enterprise spending on mobile wireless is California, followed by Texas, the two most populous states.

Based on information from Table 1 and Table 2, Table 3 presents estimates of wireless industry expenditures by state from 2005 - 2007. Total 4 displays the estimated total wireless industry consumer and business expenditures per capita by state from 2005-2007. The highest per capita spending on wireless services were in the District of Columbia and Alaska. Nationwide, per capita spending on wireless services has increased from \$479 in 2005 to \$600 in 2007.

Increased American consumer spending on wireless services is a reflection of many factors—including new customers, new technologies, and better services—but not higher prices.⁵ Just the opposite: wireless voice prices by any measure have consistently fallen over time,⁶ and the same decreasing price pattern holds for wireless data services as well. Rates based on revenue per minute for wireless voice services in the United States are lower than in other major economies, and Americans correspondingly use wireless services more intensively than consumers elsewhere.⁷ Rates for wireless broadband services are lower in the United States than in much of the rest of the world.⁸

Economists have techniques to measure not merely how much consumers spend on services, but how much consumers benefit – a term described as *consumer surplus* — from declining prices and improved quality of service. Measurements by eminent economist Jerry Hausman suggested consumer welfare gains of \$50 billion (1997 dollars) per year from the availability of wireless services in 1994.⁹ This figure is based on total

consumer expenditures for purely voice-grade service by approximately 24 million subscribers¹⁰ in the amount of \$20 billion.¹¹ Measures of consumer surplus today — with more than 266 million subscribers, much lower prices, a vastly expanded array of services and total expenditures in excess of \$180 billion in 2007 — would almost certainly be in the range of hundreds of billions of dollars annually.

Consumer benefits from wireless services are also inextricably intertwined with access to the Internet and broadband services.¹² Broadband access is increasingly wireless in orientation,¹³ and that trend is almost certain to continue. This means that more and more Americans are accessing the Internet wirelessly to make purchases.¹⁴ By 2006, more than \$1.5 trillion in manufacturing orders, or more than 30 percent of all manufacturing orders, were made electronically, presumably some wirelessly.¹⁵ In the same year, more than \$1.1 trillion in wholesale orders, or more than 20 percent of all wholesale orders, were made electronically, some wirelessly.¹⁶

C. Employment and employment compensation in the wireless services industry are large and growing

Employment and employee compensation are two of the primary measures of economic activity in an industry. Table 5 presents the nationwide employment compensation for production workers in the wireless industry as measured by the Department of Labor's Bureau of Labor Statistics from 1992-2007. During that time period, employment rose in most years, and ultimately more than quadrupled between 1992 and 2007. Average hourly earnings of production workers in the wireless industry in constant 2007 dollars rose in most years, both on an hourly and on a weekly basis, and almost doubled between 1992 and 2007. Hourly compensation in 2007 was \$27.93, more than 50% above the 2007 national hourly average of all production workers of \$17.42.¹⁷

Based on information from the Census Bureau, Table 6 presents actual 2006, and estimates for 2007, employment and payroll information for wireless service providers by state. As shown in Table 6, the wireless services industry in 2006 and 2007 directly employed nearly 250,000 workers with an annual payroll in excess of nearly \$14 billion in 2006, and in excess of \$16 billion in 2007.¹⁸ Texas had the largest wireless industry employment numbers of any state, and California had the largest wireless industry payroll figures in the industry. Every other state in the country had both substantial employment by the wireless services industry, and related payroll figures. The vast majority of states have wireless industry payrolls in excess of \$100 million. Because they do not include fringe benefits or the employment of contract workers, the payroll figures in Table 6 understate the total employment compensation in the wireless industry.

D. The wireless services industry provides substantial value added to the American economy

By themselves, wireless services are a major component of the American economy. In 2007, they contributed nearly \$100 billion in value added—the returns on capital and labor and the consistent measure of an industry's economic contribution—to

the American economy. In addition to offering traditional commercial mobile radio services, wireless firms also receive revenue for broadband services, software, ring tones, handsets, and other products and services demanded by their customers. The economic contribution of wireless services by themselves is greater than the economic contribution of such industries as motion pictures, motor vehicle manufacturing, and many large sectors of manufacturing.¹⁹ It is comparable in economic contribution to all agriculture in America.²⁰

Table 7 presents estimates of the economic contribution of the wireless industry by state under the assumption that value added is distributed by state proportionally to payrolls reflected in Table 6. The state with the largest value-added—the contribution of labor and capital—from the wireless services industry is California with more than \$12 billion in value added in 2007. Half of the states have estimated wireless industry value added, the economic value of the industry, in excess of \$1 billion. Table 8 presents gross domestic product by state and the wireless communications industry's share of that state's economic activity. Wireless services contributed 0.73 percent to national GDP and significantly in each state.

E. Wireless services are the hub of the wheel of a much larger set of industries that contribute to American economic growth

Much of the American economy is dependent on wireless services. They are at the hub of the wheel of much of the American economy and much of our economic growth. Wireless services are part of a broader set of services that connect individuals and businesses with one another in the same town, across America, and around the world. This broader category of services can be described as *networked communications services* and includes wireline communications services, broadcast services, cable services, and satellite communications services.

Table 9 presents by state the value added economic contribution of this combination of networked communications industries, both wireless and other services, to the American economy in 2007. Together, they contributed nearly \$350 billion to the American economy, or 2.53% of total economic activity. California, New York, and Texas had the largest levels of economic activity for networked services. These industries contributed more than 4% of the total state economic activity in Colorado, Georgia, Kansas, and New York.

The wireless services industry is at the center of the broader networked communications industry. Moreover, it is also the nucleus of a broader economic sector that includes the industries that both supply to--and distribute from--the networked communications services and equipment.

The businesses that provide equipment, software, and services to the networked communications industry are part of the *upstream* industry for networked communications services.²¹ Equipment includes advanced electronics for handsets as well as communications systems equipment for telecommunications networks. Software

enables services ranging from simple voice and ringtones to wireless broadband services. Still other businesses such as advertising provide services for which the core wireless services industry is a major customer.

Other businesses help distribute networked communications services, including wireless services, through wholesale and retail distribution channels.²² These are the *downstream* industries.

Every business in America uses networked communications services and particularly wireless communications services. From construction workers to truckers, from maintenance employees to technicians, Americans use wireless services in every manner of work. Many businesses are entirely or largely dependent on networked communications services.

No industry is more dependent on wireless services and networked communications services than computers and computer services. Virtually all computers today are part of a networked communications service from local networks within a school, business, or campus to wider area networks and ultimately to the Internet. I will refer to “computer industries related to wireless services” as an example of the dependency of other industries on wireless and other networked services.²³ Both because many industries are partially dependent on wireless services and because many firms in other industries provide computer services internally rather than contracting for them, the industries designated as “computer industries related to wireless services” almost certainly understate the actual size of the industries dependent or related to wireless services.

How much do all of the various industries dependent upon or supporting wireless services contribute to the national and state economies? Of course, the answer is extraordinarily large and ultimately unknowable. Practically all American workers have a wireless device which makes them more productive and more flexible.²⁴ I reach three conclusions:

- Networked communications services, including wireless services, support a large portion of the American economy;
- The economic growth related to networked communications services is primarily from wireless services; and
- Millions of Americans work in businesses related to networked communications services.

1. Networked communications services, including wireless services, support a large portion of the American economy

Table 10 presents the value-added of the five industry groups related to networked communications services in 2007 as well as their share of the American economy. As can be seen, wireless services contributed nearly \$100 billion to the American economy in 2007. Other networked communications services contributed nearly \$250 billion to

the economy, and the wireless upstream and downstream industries noted herein collectively contributed nearly another \$100 billion. Altogether, the communications industries contributed nearly \$450 billion, or approximately 3.21 percent of GDP.

In addition, the closely related computer industries contributed slightly less than \$500 billion to the American economy, and jointly the communications and computer industries contributed more than \$930 billion to the economy or more than 6.7 percent of total GDP.

2. *The economic growth related to networked communications services is primarily from wireless services*

The economic size and importance of networked communications industries in 2007 is all the more dramatic in comparison with the size of the industry just two decades ago when there was no significant commercial wireless industry or internet industry. The federal government only established a separate industry code for wireless services beginning in 1990.

Table 11 shows the economic growth of the networked communications services industries between 1992 and 2007, in five year increments and in 2007 dollars.²⁵ As can be seen, the wireless industry grew from less than \$10 billion in economic value added in 1992 to nearly \$100 billion in 2007. The economic growth rate for the industry between 1992 and 2002 was an astounding 20 percent real growth annually. Few industries record such rapid growth over a sustained time period. Wireless economic growth between 2002 and 2007 “slowed” to less than 12 percent annually, still a remarkably rapid rate.

The economic growth rates for other networked communications industries, as shown in Table 11, were substantially less than those for the wireless industry. Other networked communications services industries had declining rates of growth in the 1990s, and had negative growth from 2002 through 2007. These industries in 1992 were collectively more than 20 times the size of the wireless services industries; by 2007, they were only 2.5 times as large.

The upstream manufacturing industries noted above reached their peak in the late 1990s and have declined ever since. In 1997, these upstream industries were more than three times as large as the wireless services industry; by 2007, they were barely half as large.

The downstream distribution industries have also fallen behind the wireless services industries. As recently as 1997, the downstream industries were more than 70 percent larger than the wireless industry. By 2007, they are less than half as large.

The related computer industries grew rapidly in early and mid-1990s. But even these computer industries, often associated with the growth of the American economy, have grown at a slower rate since 1997, even slower than the remainder of the American economy. Part of the slow growth reflects the negative growth of some of the computer manufacturing industry. But even the high-growth industries such as software and

computer services, which grew more rapidly than the economy as a whole, have not grown as rapidly as the wireless industry.

Collectively, these five sectors related to network services and computers account for nearly one trillion dollars in economy activity. Although often associated with images of rapid economic growth, this collective sector has actually grown more slowly than the remainder of the American economy over the past 10 years. The major exception has been the wireless services industry. Indeed, even at a relatively slow 12% growth rate over the past five years, no other major sector of the economy has grown more rapidly.

3. Millions of Americans work in businesses related to networked communications services

Employment and employee compensation are two of the primary measures of economic activity in an industry. Table 12 presents employment in the industries related to networked communications services. As shown in the Table 12, the wireless services industry employs more than 250 thousand workers, and these workers are employed in all 50 states. Surprisingly, the employment by the wireless industry is less than that of any of the other four industry segments examined in this report, including both the upstream manufacturing industries and the downstream distribution industries, both of which have less economic value added than wireless services. The computer-dependent industries account for well over half of the more than 5.3 million workers who are employed in the combined communications and computer sector.

Workers have contributed to the substantial economic activity in the wireless services in many ways. The industry is capital intensive which enhances the value of labor.²⁶ Part of the economic value of the wireless industry comes from substantial investments in capital infrastructure over the past 20 years. Partly as a result, the wireless services industry has had increasingly productive workers. As illustrated in Table 13, the wireless services industry has increasingly offered higher wages than those earned by workers in other networked communications industries. In 1997, the wireless services industry had the lowest average hourly earnings among the networked services industries. By 2007, the average hourly earnings in the wireless industry exceeded those of other networked services industries.

F. Conclusion

Practically every American and every American business uses wireless services or related services. The wireless services industry is one of the fastest growing industries in America. For the past 15 years, it has grown at well over 16 percent per year, while the remainder of the economy has barely grown at 3 percent. It employs more than 250 thousand workers and is an integral part of the economy of every state. Wireless services are the vital hub of a much larger sector of the economy that includes other networked services industries and related computer industries. Collectively, this larger sector accounts for nearly \$1 trillion in economic activity, more than 6.7 percent of the

American economy, and employs more than 5.3 million American workers. This sector and the broader American economy today are dependent on the wireless services industry; tomorrow, they will be even more so.

Table 1

Expenditures on Wireless Services

1997-2007

(in millions of dollars)

1992	12,270
1997	38,271
1998	42,584
1999	54,180
2000	65,846
2001	86,336
2002	99,193
2003	112,089
2004	128,910
2005	141,824
2006	161,904
2007	181,065

Source: U.S. Census Bureau, Service Annual Survey and Service Quarterly Survey, various years, author's calculations.

NAICS 5172 and part of 5173 for 2004-2007;

NAICS 51332 for 1997-2003;

SIC 4812 for 1992.

Table 2

2005 Wireless Industry Revenue by State
(in millions of dollars)

	FCC Wireless Services Contribution Base			Estimated Total
	Intrastate	Interstate	Total	Wireless Services Industry
Alabama	\$1,225	\$358	\$1,583	\$2,097
Alaska	\$293	\$123	\$416	\$551
Arizona	1,528	447	\$1,975	\$2,616
Arkansas	724	212	\$936	\$1,240
California	10,595	3,098	\$13,693	\$18,140
Colorado	1,315	385	\$1,700	\$2,252
Connecticut	1,004	294	\$1,298	\$1,720
Delaware	306	90	\$396	\$525
DC	322	94	\$416	\$551
Florida	5,418	1,584	\$7,002	\$9,276
Georgia	2,594	759	\$3,353	\$4,442
Hawaii	403	118	\$521	\$690
Idaho	335	98	\$433	\$574
Illinois	3,694	1,080	\$4,774	\$6,324
Indiana	1,411	413	\$1,824	\$2,416
Iowa	686	201	\$887	\$1,175
Kansas	663	194	\$857	\$1,135
Kentucky	1,075	314	\$1,389	\$1,840
Louisiana	1,291	378	\$1,669	\$2,211
Maine	338	99	\$437	\$579
Maryland	1,799	526	\$2,325	\$3,080
Massachusetts	1,859	544	\$2,403	\$3,183
Michigan	2,687	786	\$3,473	\$4,601
Minnesota	1,346	393	\$1,739	\$2,304
Mississippi	701	205	\$906	\$1,200
Missouri	1,500	439	\$1,939	\$2,569
Montana	201	59	\$260	\$344
Nebraska	465	136	\$601	\$796
Nevada	692	202	\$894	\$1,184
New Hampshire	395	115	\$510	\$676
New Jersey	3,131	916	\$4,047	\$5,361
New Mexico	442	129	\$571	\$756
New York	5,126	1,499	\$6,625	\$8,777
North Carolina	2,367	692	\$3,059	\$4,052
North Dakota	167	49	\$216	\$286
Ohio	3,039	889	\$3,928	\$5,204
Oklahoma	862	252	\$1,114	\$1,476
Oregon	917	268	\$1,185	\$1,570
Pennsylvania	3,162	925	\$4,087	\$5,414

Table 2 Continued

2005 Wireless Industry Revenue by State
(in millions of dollars)

	FCC Wireless Services Contribution Base			Estimated Total Wireless Services Industry
	Intrastate	Interstate	Total	
Puerto Rico	863	252	\$1,115	\$1,477
Rhode Island	282	82	\$364	\$482
South Carolina	1,117	327	\$1,444	\$1,913
South Dakota	187	55	\$242	\$321
Tennessee	1,633	477	\$2,110	\$2,795
Texas	6,204	1,814	\$8,018	\$10,622
Utah	610	178	\$788	\$1,044
Vermont	127	37	\$164	\$217
Virginia	2,111	617	\$2,728	\$3,614
Washington	1,721	503	\$2,224	\$2,946
West Virginia	354	103	\$457	\$605
Wisconsin	1,375	402	\$1,777	\$2,354
Wyoming	142	42	\$184	\$244
Total	\$82,804	\$24,252	\$107,056	\$141,824

Derived from FCC Universal Service Monitoring Report, USF Tables 1.15 & 1.16, at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-279226A1.pdf.

Estimated total wireless services industry is based on state share applied to total industry revenue from Table 1.

Table 3

Estimated Wireless Industry Revenue by State
Selected Years
(in millions of dollars)

	2005	2006	2007
Alabama	\$2,097	\$2,394	\$2,677
Alaska	\$551	\$629	\$704
Arizona	\$2,616	\$2,987	\$3,340
Arkansas	\$1,240	\$1,416	\$1,583
California	\$18,140	\$20,708	\$23,159
Colorado	\$2,252	\$2,571	\$2,875
Connecticut	\$1,720	\$1,963	\$2,195
Delaware	\$525	\$599	\$670
DC	\$551	\$629	\$704
Florida	\$9,276	\$10,589	\$11,843
Georgia	\$4,442	\$5,071	\$5,671
Hawaii	\$690	\$788	\$881
Idaho	\$574	\$655	\$732
Illinois	\$6,324	\$7,220	\$8,074
Indiana	\$2,416	\$2,758	\$3,085
Iowa	\$1,175	\$1,341	\$1,500
Kansas	\$1,135	\$1,296	\$1,449
Kentucky	\$1,840	\$2,101	\$2,349
Louisiana	\$2,211	\$2,524	\$2,823
Maine	\$579	\$661	\$739
Maryland	\$3,080	\$3,516	\$3,932
Massachusetts	\$3,183	\$3,634	\$4,064
Michigan	\$4,601	\$5,252	\$5,874
Minnesota	\$2,304	\$2,630	\$2,941
Mississippi	\$1,200	\$1,370	\$1,532
Missouri	\$2,569	\$2,932	\$3,279
Montana	\$344	\$393	\$440
Nebraska	\$796	\$909	\$1,016
Nevada	\$1,184	\$1,352	\$1,512
New Hampshire	\$676	\$771	\$863
New Jersey	\$5,361	\$6,120	\$6,845
New Mexico	\$756	\$864	\$966
New York	\$8,777	\$10,019	\$11,205
North Carolina	\$4,052	\$4,626	\$5,174
North Dakota	\$286	\$327	\$365
Ohio	\$5,204	\$5,940	\$6,643
Oklahoma	\$1,476	\$1,685	\$1,884
Oregon	\$1,570	\$1,792	\$2,004
Pennsylvania	\$5,414	\$6,181	\$6,912

Table 3 Continued

**Estimated Wireless Industry Revenue by State
Selected Years**
(in millions of dollars)

Puerto Rico	\$1,477	\$1,686	\$1,886
Rhode Island	\$482	\$550	\$616
South Carolina	\$1,913	\$2,184	\$2,442
South Dakota	\$321	\$366	\$409
Tennessee	\$2,795	\$3,191	\$3,569
Texas	\$10,622	\$12,126	\$13,561
Utah	\$1,044	\$1,192	\$1,333
Vermont	\$217	\$248	\$277
Virginia	\$3,614	\$4,126	\$4,614
Washington	\$2,946	\$3,363	\$3,761
West Virginia	\$605	\$691	\$773
Wisconsin	\$2,354	\$2,687	\$3,005
Wyoming	\$244	\$278	\$311
Total	\$141,824	\$161,904	\$181,065

Derived from Tables 1 and 2.

Table 4

**Estimated Wireless Industry
Revenue
Per Capita by State
Selected Years
(in dollars)**

	2005	2006	2007
Alabama	\$462	\$522	\$579
Alaska	\$823	\$929	\$1,029
Arizona	\$440	\$484	\$527
Arkansas	\$447	\$504	\$558
California	\$504	\$571	\$634
Colorado	\$482	\$539	\$591
Connecticut	\$493	\$562	\$627
Delaware	\$624	\$702	\$774
DC	\$947	\$1,075	\$1,196
Florida	\$523	\$586	\$649
Georgia	\$488	\$543	\$594
Hawaii	\$545	\$616	\$687
Idaho	\$402	\$447	\$488
Illinois	\$497	\$565	\$628
Indiana	\$386	\$438	\$486
Iowa	\$398	\$451	\$502
Kansas	\$414	\$470	\$522
Kentucky	\$441	\$500	\$554
Louisiana	\$492	\$595	\$658
Maine	\$441	\$503	\$561
Maryland	\$553	\$628	\$700
Massachusetts	\$495	\$565	\$630
Michigan	\$455	\$520	\$583
Minnesota	\$450	\$510	\$566
Mississippi	\$414	\$473	\$525
Missouri	\$444	\$502	\$558
Montana	\$368	\$415	\$459
Nebraska	\$454	\$515	\$573
Nevada	\$492	\$542	\$589
New Hampshire	\$518	\$588	\$656
New Jersey	\$619	\$706	\$788
New Mexico	\$395	\$445	\$490
New York	\$456	\$520	\$581
North Carolina	\$467	\$522	\$571
North Dakota	\$450	\$512	\$571
Ohio	\$454	\$518	\$579
Oklahoma	\$417	\$471	\$521
Oregon	\$432	\$486	\$535
Pennsylvania	\$438	\$498	\$556

Table 4 Continued

**Estimated Wireless Industry
Revenue
Per Capita by State
Selected Years
(in dollars)**

	2005	2006	2007
Puerto Rico	\$378	\$430	\$478
Rhode Island	\$452	\$519	\$582
South Carolina	\$450	\$504	\$554
South Dakota	\$411	\$464	\$514
Tennessee	\$467	\$525	\$580
Texas	\$465	\$518	\$567
Utah	\$417	\$462	\$504
Vermont	\$351	\$400	\$446
Virginia	\$478	\$540	\$598
Washington	\$470	\$528	\$582
West Virginia	\$335	\$382	\$427
Wisconsin	\$425	\$482	\$537
Wyoming	\$481	\$543	\$595
Total	\$479	\$542	\$600

Population for the Census Bureau Annual Population Estimates
at <http://www.census.gov/popest/states/NST-ann-est.html>.

Table 5
Average Earnings of Production Workers in the
Wireless Industry
1992-2007

Year	Average Earnings of Production Workers	
	Hourly	Weekly
	2007 dollars	
1992	\$16.10	\$613.32
1993	\$16.41	\$625.22
1994	\$15.26	\$587.04
1995	\$15.88	\$620.22
1996	\$16.70	\$621.65
1997	\$17.19	\$646.12
1998	\$17.45	\$664.22
1999	\$17.26	\$641.05
2000	\$17.23	\$656.66
2001	\$17.83	\$678.67
2002	\$18.09	\$717.72
2003	\$20.14	\$841.32
2004	\$20.07	\$818.27
2005	\$21.60	\$841.14
2006	\$25.67	\$1,025.85
2007	\$27.93	\$1,162.19

Source: Bureau of Labor Statistics based on the Current Employment Statistics survey at <http://data.bls.gov/PDQ/outside.jsp?survey=ce>.

Table 6
Employees and Payroll for Wireless Services Industry By State
2006 and Estimates for 2007

	2006 Census Report			2007 Estimates	
	Employees	Payroll Thousands of 2007 dollars	Establishments	Employees	Payroll Thousands of 2007 dollars
Alabama	2799	\$117,483	272	2,923	\$139,014
Alaska	250-499		43	366	\$23,934
Arizona	2,500-4,999		223	3,662	\$161,384
Arkansas	3,457	\$194,799	84	3,611	\$230,499
California	23,854	\$1,724,131	1386	24,914	\$2,040,110
Colorado	5,637	\$277,754	219	5,888	\$328,657
Connecticut	1,986	\$122,519	123	2,074	\$144,973
Delaware	100-249		32	171	\$11,169
District of Columbia	500-999		30	732	\$47,869
Florida	14,845	\$695,004	874	15,505	\$822,376
Georgia	11,734	\$689,261	467	12,256	\$815,580
Hawaii	500-999		65	732	\$47,869
Idaho	1,366	\$52,031	63	1,427	\$61,566
Illinois	9,236	\$591,966	525	9,647	\$700,455
Indiana	2,632	\$132,555	218	2,749	\$156,848
Iowa	1,553	\$67,407	172	1,622	\$79,761
Kansas	12,617	\$881,701	137	13,178	\$1,043,288
Kentucky	2,355	\$84,273	236	2,460	\$99,717
Louisiana	4,363	\$165,361	221	4,557	\$195,666
Maine	1,000-2,499		69	1,709	\$111,694
Maryland	3,333	\$206,524	230	3,481	\$244,373
Massachusetts	2,616	\$183,854	210	2,732	\$217,549
Michigan	4,098	\$220,257	335	4,280	\$260,624
Minnesota	3,212	\$174,622	186	3,355	\$206,624
Mississippi	2,500-4,999		176	3,662	\$112,556
Missouri	1,000-2,499		184	1,709	\$128,086
Montana	250-499		34	73	\$4,787
Nebraska	250-499		46	366	\$23,934
Nevada	837	\$58,112	101	874	\$68,762
New Hampshire	250-499		51	366	\$23,934
New Jersey	9,877	\$720,215	315	10,316	\$852,208
New Mexico	1,000-2,499		93	1,709	\$111,694

Table 6 Continued
Employees and Payroll for Wireless Services Industry By State
2006 and Estimates for 2007

	2006 Census Report			2007 Estimates	
	Employees	Payroll 2007 dollars	Establishments	Employees	Payroll 2007 dollars
New York	7,692	\$471,919	642	8,034	\$558,407
North Carolina	6,351	\$285,654	373	6,633	\$338,006
North Dakota	20-99		15	59	\$3,830
Ohio	6,420	\$358,341	378	6,705	\$424,013
Oklahoma	6,191	\$217,753	177	6,466	\$257,660
Oregon	3,896	\$143,562	170	4,069	\$169,872
Pennsylvania	7,261	\$422,111	372	7,584	\$499,470
Rhode Island	231	\$14,971	24	241	\$17,715
South Carolina	4,095	\$169,298	186	4,277	\$200,326
South Dakota	20-99		15	59	\$3,830
Tennessee	6,871	\$277,056	285	7,176	\$327,832
Texas	25,309	\$1,254,316	1,024	26,434	\$1,484,192
Utah	1,822	\$91,929	110	1,903	\$108,777
Vermont	165	\$7,642	24	172	\$9,043
Virginia	9,456	\$771,449	303	9,876	\$912,831
Washington	14,605	\$1,163,648	299	15,254	\$1,376,908
West Virginia	250-499		63	366	\$23,934
Wisconsin	3,306	\$201,807	203	3,453	\$238,792
Wyoming	254	\$12,723	25	265	\$15,055
United States	241,407	\$13,926,498	12,108	252,136	\$16,488,057

Source: Census Bureau, County Business Patterns for 2006, author's calculations

Note: where "0" is shown for payroll, too few reporting firms to disclose
Source: BLS as reported at U.S. Census Bureau County Business Patterns
at <http://censtats.census.gov/cgi-bin/cbpnaic/cbpcomp.pl>

Table 7

**Estimates of Value Added by State
for the Wireless Services Industry
in millions of 2007 dollars**

	Estimates of value added	
	2006	2007
Alabama	\$814	\$891
Alaska	\$140	\$153
Arizona	\$945	\$1,035
Arkansas	\$1,350	\$1,478
California	\$11,949	\$13,083
Colorado	\$1,925	\$2,108
Connecticut	\$849	\$930
Delaware	\$65	\$72
District of Columbia	\$280	\$307
Florida	\$4,817	\$5,274
Georgia	\$4,777	\$5,230
Hawaii	\$280	\$307
Idaho	\$361	\$395
Illinois	\$4,103	\$4,492
Indiana	\$919	\$1,006
Iowa	\$467	\$512
Kansas	\$3,849	\$4,214
Kentucky	\$584	\$639
Louisiana	\$1,146	\$1,255
Maine	\$496	\$543
Maryland	\$1,431	\$1,567
Massachusetts	\$1,274	\$1,395
Michigan	\$1,527	\$1,671
Minnesota	\$1,210	\$1,325
Mississippi	\$659	\$722
Missouri	\$750	\$821
Montana	\$28	\$31
Nebraska	\$140	\$153
Nevada	\$403	\$441
New Hampshire	\$140	\$153
New Jersey	\$4,992	\$5,465

Table 7 Continued

**Estimates of Value Added by State
for the Wireless Services Industry
in millions of 2007 dollars**

	Estimates of value added	
	2006	2007
New Mexico	\$654	\$716
New York	\$3,271	\$3,581
North Carolina	\$1,980	\$2,168
North Dakota	\$22	\$25
Ohio	\$2,484	\$2,719
Oklahoma	\$1,509	\$1,652
Oregon	\$995	\$1,089
Pennsylvania	\$2,926	\$3,203
Rhode Island	\$104	\$114
South Carolina	\$1,173	\$1,285
South Dakota	\$22	\$25
Tennessee	\$1,920	\$2,102
Texas	\$8,693	\$9,518
Utah	\$637	\$698
Vermont	\$53	\$58
Virginia	\$5,347	\$5,854
Washington	\$4,976	\$5,448
West Virginia	\$140	\$153
Wisconsin	\$1,399	\$1,531
Wyoming	\$88	\$97
United States	\$91,067	\$99,707

Source: Census Bureau, County Business Patterns for 2006, author's calculations

Table 8

**Estimates of Value Added by State in 2007
for the Wireless Services Industry
Relative to state Gross Domestic Product
in millions of 2007 dollars**

	State GDP	Wireless Value Added	Wireless share of GDP
Alabama	\$165,796	\$891	0.54%
Alaska	\$44,517	\$153	0.34%
Arizona	\$247,028	\$1,035	0.42%
Arkansas	\$95,371	\$1,478	1.55%
California	\$1,812,968	\$13,083	0.72%
Colorado	\$236,324	\$2,108	0.89%
Connecticut	\$216,266	\$930	0.43%
Delaware	\$60,118	\$72	0.12%
District of Columbia	\$93,819	\$307	0.33%
Florida	\$734,519	\$5,274	0.72%
Georgia	\$396,504	\$5,230	1.32%
Hawaii	\$61,532	\$307	0.50%
Idaho	\$51,149	\$395	0.77%
Illinois	\$609,570	\$4,492	0.74%
Indiana	\$246,439	\$1,006	0.41%
Iowa	\$129,026	\$512	0.40%
Kansas	\$117,305	\$4,214	3.59%
Kentucky	\$154,184	\$639	0.41%
Louisiana	\$216,146	\$1,255	0.58%
Maine	\$48,108	\$543	1.13%
Maryland	\$268,685	\$1,567	0.58%
Massachusetts	\$351,514	\$1,395	0.40%
Michigan	\$381,963	\$1,671	0.44%
Minnesota	\$254,970	\$1,325	0.52%
Mississippi	\$88,546	\$722	0.82%
Missouri	\$229,470	\$821	0.36%
Montana	\$34,253	\$31	0.09%
Nebraska	\$80,093	\$153	0.19%
Nevada	\$127,213	\$441	0.35%
New Hampshire	\$57,341	\$153	0.27%
New Jersey	\$465,484	\$5,465	1.17%
New Mexico	\$76,178	\$716	0.94%

Table 8 Continued

**Estimates of Value Added by State in 2007
for the Wireless Services Industry
Relative to state Gross Domestic Product
in millions of 2007 dollars**

	State GDP	Wireless Value Added	Wireless share of GDP
New York	\$1,103,024	\$3,581	0.32%
North Carolina	\$399,446	\$2,168	0.54%
North Dakota	\$27,725	\$25	0.09%
Ohio	\$466,309	\$2,719	0.58%
Oklahoma	\$139,323	\$1,652	1.19%
Oregon	\$158,233	\$1,089	0.69%
Pennsylvania	\$531,110	\$3,203	0.60%
Rhode Island	\$46,900	\$114	0.24%
South Carolina	\$152,830	\$1,285	0.84%
South Dakota	\$33,934	\$25	0.07%
Tennessee	\$243,869	\$2,102	0.86%
Texas	\$1,141,965	\$9,518	0.83%
Utah	\$105,658	\$698	0.66%
Vermont	\$24,543	\$58	0.24%
Virginia	\$382,964	\$5,854	1.53%
Washington	\$311,270	\$5,448	1.75%
West Virginia	\$57,711	\$153	0.27%
Wisconsin	\$232,293	\$1,531	0.66%
Wyoming	\$31,514	\$97	0.31%
United States	\$13,743,020	\$99,706	0.73%

Source: Table 7, author's calculations

BEA GDP by state at <http://www.bea.gov/regional/gsp/>

Table 9

**Estimates of Value Added by State in 2007
for the Networked Services Industry including Wireless Services
Relative to state Gross Domestic Product
in millions of 2007 dollars**

	State GDP	Networked Services Value Added	Networked share of GDP
Alabama	\$165,796	\$4,137	2.50%
Alaska	\$44,517	\$887	1.99%
Arizona	\$247,028	\$4,237	1.72%
Arkansas	\$95,371	\$2,889	3.03%
California	\$1,812,968	\$45,159	2.49%
Colorado	\$236,324	\$13,940	5.90%
Connecticut	\$216,266	\$5,460	2.52%
Delaware	\$60,118	\$804	1.34%
District of Columbia	\$93,819	\$2,725	2.90%
Florida	\$734,519	\$20,762	2.83%
Georgia	\$396,504	\$16,809	4.24%
Hawaii	\$61,532	\$1,013	1.65%
Idaho	\$51,149	\$775	1.52%
Illinois	\$609,570	\$13,881	2.28%
Indiana	\$246,439	\$3,896	1.58%
Iowa	\$129,026	\$2,025	1.57%
Kansas	\$117,305	\$5,965	5.09%
Kentucky	\$154,184	\$2,766	1.79%
Louisiana	\$216,146	\$3,546	1.64%
Maine	\$48,108	\$769	1.60%
Maryland	\$268,685	\$7,048	2.62%
Massachusetts	\$351,514	\$6,505	1.85%
Michigan	\$381,963	\$6,508	1.70%
Minnesota	\$254,970	\$4,457	1.75%
Mississippi	\$88,546	\$1,815	2.05%
Missouri	\$229,470	\$6,120	2.67%
Montana	\$34,253	\$715	2.09%
Nebraska	\$80,093	\$1,230	1.54%
Nevada	\$127,213	\$1,667	1.31%
New Hampshire	\$57,341	\$860	1.50%
New Jersey	\$465,484	\$13,441	2.89%

Table 9 Continued

**Estimates of Value Added by State in 2007
for the Networked Services Industry Including the Wireless
Services Industry
Relative to state Gross Domestic Product
in millions of 2007 dollars**

	State GDP	Networked Services Value Added	Networked share of GDP
New Mexico	\$76,178	\$1,312	1.72%
New York	\$1,103,024	\$44,880	4.07%
North Carolina	\$399,446	\$6,785	1.70%
North Dakota	\$27,725	\$556	2.01%
Ohio	\$466,309	\$7,033	1.51%
Oklahoma	\$139,323	\$3,381	2.43%
Oregon	\$158,233	\$2,215	1.40%
Pennsylvania	\$531,110	\$13,123	2.47%
Rhode Island	\$46,900	\$979	2.09%
South Carolina	\$152,830	\$3,198	2.09%
South Dakota	\$33,934	\$798	2.35%
Tennessee	\$243,869	\$5,260	2.16%
Texas	\$1,141,965	\$29,043	2.54%
Utah	\$105,658	\$1,632	1.54%
Vermont	\$24,543	\$658	2.68%
Virginia	\$382,964	\$11,091	2.90%
Washington	\$311,270	\$7,713	2.48%
West Virginia	\$57,711	\$1,119	1.94%
Wisconsin	\$232,293	\$3,886	1.67%
Wyoming	\$31,514	\$330	1.05%
United States	\$13,743,020	\$347,807	2.53%

Source: Table 8, author's calculations

BEA GDP by state at <http://www.bea.gov/regional/gsp/>

Table 10		
Economic Contribution of Industries Related to Wireless Networked Communications Services		
In 2007		
	Value Added (in billions of dollars)	Percentage Share of American economy
Wireless services	99.7	0.73
Other networked communications industries	248.2	1.79
Upstream manufacturing industries	51.3	0.37
Downstream distribution industries	44.6	0.32
Total communications industries	443.8	3.21
Related computer industries	488.5	3.53
Total communications and related computer industries	932.3	6.74

Table 11 Historical Value Added and Contribution of Industries Related to Networked Communications Services							
	Value Added				Average Annual Growth Rate		
	(In billions of 2007 dollars)						
	1992	1997	2002	2007	1992-1997	1997-2002	2002-2007
Wireless services	9.8	24.5	58.5	99.7	20.1%	19.1%	11.2%
Other networked communications services	209.6	237.5	261.9	248.2	2.5%	2.0%	-1.1%
Upstream industries	46.9	76.5	51.7	51.3	10.3%	-7.5%	-0.1%
Downstream industries	29.9	42.1	40.7	44.6	7.1%	-0.6%	1.8%
Related computer industries	217.7	389.1	424.0	488.5	12.31%	1.73%	2.88%
Total sector related to Networked communications services	513.9	769.6	836.8	932.3	8.41%	1.69%	2.19%
Remainder of economy	8,265.3	9,645.3	11,188.1	12,909.0	3.14%	3.01%	2.90%

Table 12	
Employment in the Industries Related to Networked Communications Services	
In 2007	
	Employment (in thousands)
Wireless services	252.1
Other networked communications industries	1,145.6
Upstream industries	214.1
Downstream industries	516.8
Computer- dependent industries	3,176.6
Total	5,305.2

Sources: For wireless services, see Table 6 above. For other industries, see Bureau of Labor Statistics at <http://data.bls.gov/PDQ/outside.jsp?survey=ce>.

Table 13

**Average Hourly Earnings of Production Workers for Core Networked
Communications Services
In 2007 Dollars**

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Broadcasting (except Internet)	18.90	19.55	19.82	20.03	20.75	21.33	21.81	21.58	22.47	23.68	23.66
Telecommunications	21.94	22.18	22.02	22.25	22.61	22.73	23.52	23.25	23.44	24.22	24.57
Wired telecommunications carriers	21.97	22.19	22.01	22.28	22.66	23.29	23.94	23.91	23.78	23.80	23.67
Wireless telecommunications carriers (except satellite)	17.19	17.45	17.26	17.23	17.83	18.09	20.14	20.07	21.60	25.67	27.93
Other telecommunications	24.17	24.54	24.55	24.99	25.56	24.71	25.20	24.07	24.00	24.28	24.01

Source: Bureau of Labor Statistics at <http://data.bls.gov/PDQ/outside.jsp?survey=ce>.

¹ President, Furchtgott-Roth Economic Enterprises. The paper was prepared with the assistance of a grant from CTIA, the Wireless Association. The views expressed in this paper are those of the author and do not necessarily reflect the view of CTIA or any other entity. I wish to thank Marisa Roy and Ryan Khaldar for able research assistance in preparing this report. Any errors are my own.

² See <http://www.cellular-news.com/story/31352.php>.

³ The National Center for Health Statistics reported in May 2008 that it had found that “nearly one out of every six American homes (15.8%) had only wireless telephones during the second half of 2007. In addition, more than one out of every eight American homes (13.1%) received all or almost all calls on wireless telephones despite having a landline telephone in the home.” See Stephen J. Blumberg, Ph.D., and Julian V. Luke *Wireless Substitution: Early Release of Estimates From the National Health Interview Survey, July-December 2007*, at <http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless200805.htm>.

⁴ The extrapolation to the full range of wireless industry revenue for 2005 as presented in Table 1 is made under the assumption that the states’ shares of total industry revenue will parallel consumer service expenditures. The FCC monitors by state the purely wireless intrastate and interstate services that form the basis of universal service contributions. For example, of the nearly \$142 billion in total revenue for the industry in 2005, only \$107 billion, or approximately 75 percent, of the revenue was recorded at the FCC. See FCC, Universal Service Monitoring Report, 2007, at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-279226A1.pdf, Tables 1.15 and 1.16. The FCC’s figure of \$107 billion for wireless service revenue in 2005 is nearly the same as the Census Bureau’s figure of \$113 in 2005 as reported in the 2006 Service Annual Survey www.census.gov/svsd/www/cv.htm, Appendix A, Table A-3.3.8 and A-3.3.9.

⁵ This is the consistent finding of a series of FCC reports to Congress on the state of competition in the wireless industry. See http://wireless.fcc.gov/index.htm?job=cmrs_reports.

⁶ For example, see the BLS price series on wireless services as a component of the CPI at <http://data.bls.gov/PDQ/servlet/SurveyOutputServlet>. The series prices have fallen in every year that BLS has kept track of wireless prices. Adjustments for quality would likely lead to more dramatic declines.

⁷ See, e.g., FCC, CTIA ex parte presentation in Docket WT 05-194, January 8, 2008.

⁸ See Informa Telecoms & Media Group “Mobile Broadband: A Case Study Analysis of Mobile Broadband,” Nov. 2008, at pages 3, 5-6.) Although the Informa Telecoms & Media Group notes that the design of mobile broadband tariffs worldwide varies across components, based upon its extensive data collection, it found that globally the average monthly contract costs for mobile broadband of the US / Canada, Asia Pacific and Eastern European regions are below the world average. See Mobile Broadband Case Study at page 7, Figure 2.1.

⁹ See J. Hausman, “Valuing the Effect of Regulation on New Services in Telecommunications,” in *Brookings Papers on Economic Activity, Microeconomics*, 1997, eds. M. N. Baily, P.C. Reiss, and C. Winston, (Washington, DC: Brookings Press, 1997), 1-37.

¹⁰ FCC, CMRS Competition Eleventh Report, September 29, 2006, at 96.

¹¹ In 1995, the nearest in year in which government data are available, wireless industry revenues were approximately \$24 billion. Census Bureau, 1996 Annual Survey of Communications Services, at 2, see http://www.census.gov/svsd/www/services/sas/sas_data/historical/ascs96.pdf.

¹² See Ovum study, 2008.

¹³ See FCC, 12th annual report on competition in the mobile radio services industry, at http://wireless.fcc.gov/index.htm?job=cmrs_reports.

¹⁴ See U.S. Census Bureau, E-Stats report, Table 7, at <http://www.census.gov/eos/www/ebusiness614.htm>.

¹⁵ Ibid.

¹⁶ Ibid.

¹⁷ Bureau of Labor Statistics based on the Current Employment Statistics survey at <http://data.bls.gov/PDQ/outside.jsp?survey=ce>.

¹⁸ Estimates of employment for the wireless industry, NAICS 5172, vary substantially between the Bureau of Labor Statistics Current Employment Statistics survey and the Census Bureau’s County Business

Patterns. The BLS data are partial because of the assignment of wireless call center employees to the entirely separate telemarketing and call center category of workers, thus creating an understatement of truly wireless-related jobs in the U.S. CTIA has its own survey estimates of employment

¹⁹ See

http://www.bea.gov/industry/gpotables/gpo_action.cfm?anon=73964&table_id=22072&format_type=0.

²⁰ Ibid.

²¹ It is difficult to distinguish upstream industries for wireless services from upstream industries for other networked communications services. For the purposes of this report, upstream industries are limited to four manufacturing industries that primarily service the networked communications industry. These industries are: NAICS 3342 communications equipment manufacturing; NAICS 3343 audio and video equipment manufacturing; NAICS 33513 switchgear and switchboard apparatus manufacturing; and NAICS 33592 communications and energy wire and cable manufacturing. Parts of many other industries, both in the manufacturing sector and elsewhere, service the networked communications industries but have not been included in this report because they also serve other parts of the economy. Advertising, for example, heavily serves the networked communications services industries and the wireless services industry in particular, but it has not been included in this report.

²² It is difficult to distinguish downstream industries for wireless services from downstream industries for other networked communications services. For the purposes of this report, downstream industries are limited to two wholesale industries and one retail industry that primarily sell networked communications services. These industries are (NAICS 42362) electrical appliance, television, and radio set wholesalers; (NAICS 42369) Other electronic parts and equipment; and (NAICS 443112) radio, television, and other electronic stores. This report omits tens of thousands of other wholesale and retail outlets around America that sell parts or services for networked communications services. For example, convenience stores sell telephone calling cards and prepaid wireless phones; large discount department stores such as Walmart and Best Buy sell large ranges of networked communications equipment and services. These and other outlets are not included in this report because they are only partly, but not primarily dedicated to the distribution of networked communications equipment and services are not included in this report. Thus the measurement of the downstream industry is almost certainly understated.

²³ For the purposes of this report, computer-related industries are limited to five computer service industries and five industries in the software, manufacturing and distribution sectors. These computer services industries include (NAICS 5112) software publishing; (NAICS 516) internet publishing and broadcasting; (NAICS 5181) Internet service providers and web search portals; (NAICS 5182) Data processing, hosting, & related services; and (NAICS 5415) Computer systems design and related services. The software, manufacturing and distribution industries are (NAICS 3341) Computer & peripheral equipment manufacturing; (NAICS 3344) Semiconductor & other electronic component manufacturing; (NAICS 3346) Semiconductor & other electronic component manufacturing; (NAICS 42343) Computer & computer peripheral equipment & software merchant wholesalers; and (NAICS 44312) Computer & software stores. These industries reflect those that are primarily rather than just partially in the computer industry. The computer products and services include those provided by such familiar firms as Dell, HP, Microsoft, Google, and Yahoo!.

²⁴ Estimates of productivity increases alone are well over \$100 billion annually. See, e.g., Ovum, *Economic Impact of the U.S. Wireless Industry on the U.S. Economy*, 2008.

²⁵ These five year increments reflect the years of the Economic Census conducted by the Census Bureau.

²⁶ The wireless communications industry accounted for 2.23 percent of capital expenditures in the United States in 2006, but only 0.73 percent of GDP. See Census Bureau, Annual Capital Expenditures Survey, at Table 4.a, at <http://www.census.gov/csd/ace/xls/2006/Full%20Report.htm>.